UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P O Box 1450
Alexandria, Virginia 22313-1450
www uspto gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,425	06/13/2006	Edmond Lassalle	324-188	6448

22429 7590 06/24/2009
LOWE HAUPTMAN HAM & BERNER, LLP
1700 DIAGONAL ROAD
SUITE 300
ALEXANDRIA, VA 22314

EXAMINER	
COLUCCI, MICHAEL C	
ART UNIT	PAPER NUMBER
2626	

MAIL DATE	DELIVERY MODE
06/24/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/596,425	**Applicant(s)** LASSALLE, EDMOND	
	Examiner MICHAEL C. COLUCCI	**Art Unit** 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 March 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 03/31/2009 have been fully considered but they are not persuasive.

Argument (page 6 paragraph 4 & page 9 paragraph 1):

- "Therefore, Griniasty starts training of a text-to-phoneme parser by incorporating a partition of words into phonemes. In the example of table 66 in figure 5 [0015], by using the initial emission probability matrices, a supervised segmentation is next performed to segment the word "LOCATION" in the dictionary into its corresponding individual phonemes (block 38) by using a known string of phonemes "(L) (OW) (K) (EY) (SH) (AH) (N)" obtained from the phonetic dictionary, as shown along the vertical axis of the table 66. Therefore, Griniasty does not disclose the first step in claim 1, i.e., entering global transcriptions of said graphic chains into said phonetic chains into a database accessible by said computer."
- "As in Luk ("Stochastic phonographic transduction for English"), Griniasty fails to disclose, for each transcription of a given graphic chain with M graphic elements into a corresponding phonetic chain with N phonetic elements, determining by MxN iterations (not entering) second probabilities of MxN second transcriptions of M graphic chains resulting from M successive concatenations of 1 to M graphic elements into N

> phonetic chains resulting from N successive concatenations of 1 to N phonetic elements, each second probability of a second transcription depending on a preceding estimated first probability of last graphic and phonetic element of said second transcription and depending on the highest of three respective second probabilities determined by preceding iterations, M and N being integers"

Response to argument:

NOTE: Examiner would like to remind Applicant of the following:

"USPTO personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023,1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim should not be read into the claim. E-Pass Techs., Inc. v. 3Com Corp., 343 F.3d1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (claims must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily). In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969). See also In re Zletz, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow.... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed.... An

essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process."). Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. Toro Co. v. White Consolidated Industries Inc., 199 F.3d 1295, 1301, 53 USPQ2d 1065, 1069 (Fed. Cir. 1999) (meaning of words used in a claim is not construed in a "lexicographic vacuum, but in the context of the specification and drawings."). Any special meaning assigned to a term "must be sufficiently clear in the specification that any departure from common usage would be so understood by a person of experience in the field of the invention." Multiform Desiccants Inc. v. Medzam Ltd., 133 F.3d 1473, 1477, 45 USPQ2d 1429, 1432 (Fed. Cir. 1998). See also MPEP § 2111.01."

Examiner believes that Luk explicitly teaches limitations of claim 1, wherein in accordance with the present invention (e.g. present invention Abstract), the present invention is merely representing word as phonetic chains based on first and second probabilities and phonetic matrix, where probabilities are merely dependent on previous data in a Bayesian sense (e.g. present invention equations page 8 and 10) . Further, in accordance with the use of matrices of the present invention, the teachings of Luk directly exhibit alignment of the proper segmentation of a word into its phonemes or phonetics (e.g. present invention

page 12, matrix). Luk explicitly teaches the spelling of a word as input, wherein letters and phonemes are parsed to represent the best sequence of phoneme parts. This is accomplished through various probabilistic passes, wherein a maximum likelihood criteria is utilized (Abstract). Overall, Luk teaches the concept of claim 1, whereby a best path for phonetic segmentation is chosen representative of probabilities within a 2 dimensional (i.e. MxN) matrix.

Further, Luk teaches probabilistic representation of language theory, wherein a Bayesian probability initially exists as a language rule prior to segmentation, wherein a computer system is free to align/segment strings (3. Formalism).

Furthermore, Luk teaches a first probabilistic pass for a word as part of a training scheme and pronunciation/phonetic segmentation, wherein a matrix is created for one string given the state of another string to form several probabilities based on a preceding letter/phoneme in an input string/word (page 141 - 4.1.1. Pass 1). This transition matrix is representative of the matrix described in the present invention(e.g. present invention page 12, matrix). Additionally, a second probabilistic pass is performed whereby a plurality of Bayesian probabilities are formed based on former probabilities of a transitional matrix (e.g. the present inventions spec. pages 10-13). These matrices are now representative of the best sequence of phonemes chosen for phonetic representation and maximum

likelihood path for an ideal alignment, wherein the best of 3 or more probabilities is chosen (transition from Fig. 2 to Fig. 3, pages 141-143).

Additionally, Examiner would like to point out that the probabilities of an adjacent letter depend directly on the state of the letters preceding and following (i.e. the probability of the next letter given the last, Bayesian). The matrix of Luk (Fig. 2) is an explicit representation of the teachings of claim 1 of the present invention, wherein a transition probability is well known to be the probability of a chain of data elements given the probability of a change from data elements form one state to another. This is particularly necessary for phonetic representation, as vowel/phoneme order is significant, wherein Luk explicitly teaches a precise multiple probability alignment of a word and its phonetic segmentation (Fig. 2 and 3, pages 141-143).

Examiner has incorporated Griniasty to further strengthen the teachings of Luk and demonstrate that which is obvious, wherein Griniasty teaches a repetition of phoneme segmentation of input text until a condition is satisfied (Griniasty Fig. 4 & 5). Griniasty teaches the use of probabilities given the previous letter of a string, wherein a matrix (like Luk) is formed (Griniasty [0029]).

Further, Griniasty teaches the best path/probability selected among several probabilities, wherein the selection process is repeated and previous probability

values are stored for the purposes of meeting a best condition such as table 66 (Griniasty [0019-0020], Fig. 3-5). Thus, the combined teaching of Luk in view of Griniasty renders obvious the use of first and second probabilities as well as a MxN phonetic element representation, wherein a best path within a matrix is determined to represent the proper pronunciation of an input word as single phonemes or paired phonemes.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422

F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1 and 7 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 5-7, and 11-12 of copending Application No. 11/295,689. Although the conflicting claims are not identical, they are not patentably distinct from each other because they are substantially similar in scope claiming a method for matching graphic chains including graphic elements to phonetic chains including phonetic elements.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Instant application	Application 11/295,689
Claims 1 and 7. A method and computer program, respectively,	Claims 1, 5, and 6. A method, computer system, and computer program, respectively

implemented in a computer for automatically matching graphic elements constituting given graphic chains automatically to phonetic elements constituting corresponding phonetic chains, said method including the following steps: entering global transcriptions of said graphic chains into said phonetic chains into a database accessible by said computer	for causing a computer to construct an automaton for compiling grapheme/phoneme transcription rules from an initial transcription corpus including pairs of chains, each pair having a graphic chain including graphic elements and a phonetic chain including phonetic elements,
(Claims 1 and 7.) establishing and storing a link between last elements of the graphic chain and phonetic chains of each second transcription and last elements of the graphic chain and phonetic chains of the transcription relating to said highest of said three respective second probabilities in order for links established in an MxN matrix relative to said second probabilities to constitute a	(Claims 1, 5, and 6.) said method including the following steps that are performed after grapheme/phoneme correspondences have been registered in a database by aligning said graphic elements of the graphic chains with said phonetic elements of the phonetic chains associated with said graphic chains: the method including the steps of:

single path between last and first pairs of graphic and phonetic elements of said matrix in order to segment said given graphic chain into graphemes corresponding to respective phonemes segmenting the corresponding phonetic chain and to store the matches between said graphemes and phonemes in said database, the number of graphic elements in a grapheme being identical to the number of phonetic elements in the corresponding phoneme, in order for any new graphic chain to be transcribed automatically into a phonetic chain segmented into phonemes by means of the stored matches.	

(Claims 1 and 7.) for each transcription of a given graphic chain with M graphic elements into a corresponding phonetic chain with N phonetic elements, determining by MxN iterations second probabilities of MxN second transcriptions of M graphic chains resulting from M successive concatenations of 1 to M graphic elements into N phonetic chains resulting from N successive concatenations of 1 to N phonetic elements, each second probability of a second transcription depending on a preceding estimated first probability of last graphic and phonetic element of said second transcription and depending on the highest of three respective second probabilities determined by preceding iterations, M and N being integers, and establishing and storing a link	(Claims 1, 5, and 6.) deriving and storing transcription rules in said database on the basis of an analysis of left-hand and right-hand correspondences of each grapheme/phoneme correspondence in each pair of associated graphic and phonetic chains, and causing said automaton to include states and state transitions derived from the registered transcription rules, each state being a link between two consecutive grapheme/phoneme correspondences in a pair of graphic and phonetic chains and each transition chaining two states having a correspondence in common.

between last elements of the graphic chain and phonetic chains of each second transcription and last elements of the graphic chain and phonetic chains of the transcription relating to said highest of said three respective second probabilities in order for links established in an MxN matrix relative to said second probabilities to constitute a single path between last and first pairs of graphic and phonetic elements of said matrix in order to segment said given graphic chain into graphemes corresponding to respective phonemes segmenting the corresponding phonetic chain and to store the matches between said graphemes and phonemes in said database, the number of graphic elements in a grapheme being identical to the number of phonetic elements in the corresponding phoneme, in order for any new graphic chain to be transcribed	

automatically into a phonetic chain segmented into phonemes by means of the stored matches.	

Claims 1 and 7. A method and computer program, respectively, implemented in a computer for automatically matching graphic elements constituting given graphic chains automatically to phonetic elements constituting corresponding phonetic chains, said method including the following steps:	Claims 7, 11, and 12. A method, computer system, and computer program, respectively, of causing a computer to construct a phoneticizer from a corpus stored in a database and including pairs of chains, each pair having a graphic chain including graphic elements and a phonetic chain including phonetic elements, said method including the steps of:
(Claims 1 and 7.) for each transcription of a given graphic chain with M graphic elements into a corresponding phonetic chain with N phonetic elements, determining by MxN iterations second probabilities of MxN second transcriptions of M graphic chains resulting from M successive concatenations of 1 to M graphic elements into N phonetic chains resulting from N successive	(Claims 7, 11, and 12.) constructing and storing in said database an automaton for compiling transcription rules resulting from an analysis of grapheme/phoneme correspondences in pairs of chains read in said corpus, said automaton including states and state transitions derived from transcription rules, each state being a link between two consecutive grapheme/phoneme correspondences in a pair of graphic and

concatenations of 1 to N phonetic elements, each second probability of a second transcription depending on a preceding estimated first probability of last graphic and phonetic element of said second transcription and depending on the highest of three respective second probabilities determined by preceding iterations, M and N being integers, and establishing and storing a link between last elements of the graphic chain and phonetic chains of each second transcription and last elements of the graphic chain and phonetic chains of the transcription relating to said highest of said three respective second probabilities in order for links established in an MxN matrix relative to said second probabilities to constitute a single path between last and first pairs of graphic and phonetic elements of said	phonetic chains, and each transition chaining two states having a grapheme/phoneme correspondence in common, said transitions relating to the transcription of a graphic chain into a phonetic chain forming a path of transitions in said automaton, and determining and storing in said database probabilities of the transitions at the output of nodes of the automaton situating the grapheme/phoneme correspondences common to said transitions, in order to construct said phoneticizer by combining said automaton and the determined transition probabilities.

matrix in order to segment said given graphic chain into graphemes corresponding to respective phonemes segmenting the corresponding phonetic chain and to store the matches between said graphemes and phonemes in said database, the number of graphic elements in a grapheme being identical to the number of phonetic elements in the corresponding phoneme, in order for any new graphic chain to be transcribed automatically into a phonetic chain segmented into phonemes by means of the stored matches.	

More specifically, as for the limitation “an automaton for compiling grapheme/phoneme transcription rules from an initial transcription corpus including pairs of chains, each pair having a graphic chain including graphic elements and a phonetic chain including phonetic elements” as provided in claims 1, 5, and 6 from application 11/295,689, it would have been obvious to a person having ordinary skill in the art at the time of the invention that in claims 1 and 7 from the instant application the limitations “automatically matching graphic elements constituting given graphic chains

automatically to phonetic elements constituting corresponding phonetic chains" and "entering global transcriptions of said graphic chains into said phonetic chains into a database accessible by said computer" are not significantly distinct from application 11/295,689 given that the "compiling grapheme/phoneme transcription rules from an initial transcription corpus" and using "global transcriptions of said graphic chains into said phonetic chains" are similar steps to obtain a same result.

As for the limitation "said method including the following steps that are performed after grapheme/phoneme correspondences have been registered in a database by aligning said graphic elements of the graphic chains with said phonetic elements of the phonetic chains associated with said graphic chains" as provided in claims 1, 5, and 6 from application 11/295,689, it would have been obvious to a person having ordinary skill in the art at the time of the invention that in claims 1 and 7 from the instant application the limitations "establishing and storing a link between last elements of the graphic chain and phonetic chains of each second transcription and last elements of the graphic chain and phonetic chains of the transcription" and "in order to segment said given graphic chain into graphemes corresponding to respective phonemes segmenting the corresponding phonetic chain and to store the matches between said graphemes and phonemes in said database, the number of graphic elements in a grapheme being identical to the number of phonetic elements in the corresponding phoneme, in order for any new graphic chain to be transcribed automatically into a phonetic chain segmented into phonemes by means of the stored matches" are not significantly distinct from application 11/295,689 given that the instant application stores the link that represent

the chains in order for new graphic chains to be transcribed automatically just like application 11/295,689 performs grapheme/phoneme correspondences with the stored chains in the database.

As for the limitation "deriving and storing transcription rules in said database on the basis of an analysis of left-hand and right-hand correspondences of each grapheme/phoneme correspondence in each pair of associated graphic and phonetic chains, and causing said automaton to include states and state transitions derived from the registered transcription rules, each state being a link between two consecutive grapheme/phoneme correspondences in a pair of graphic and phonetic chains and each transition chaining two states having a correspondence in common" as provided in claims 1, 5, and 6 from application 11/295,689, it would have been obvious to a person having ordinary skill in the art at the time of the invention that in claims 1 and 7 from the instant application the limitations "for each transcription of a given graphic chain with M graphic elements into a corresponding phonetic chain with N phonetic elements, determining by MxN iterations second probabilities of MxN second transcriptions of M graphic chains resulting from M successive concatenations of 1 to M graphic elements into N phonetic chains resulting from N successive concatenations of 1 to N phonetic elements" and "establishing and storing a link between last elements of the graphic chain and phonetic chains of each second transcription and last elements of the graphic chain and phonetic chains of the transcription relating to said highest of said three respective second probabilities in order for links established in an MxN matrix relative to said second probabilities to constitute a single path between last and first pairs of

graphic and phonetic elements of said matrix in order to segment said given graphic chain into graphemes corresponding to respective phonemes segmenting the corresponding phonetic chain and to store the matches between said graphemes and phonemes in said database," are not substantially different from application 11/295,689 given that the analysis of the left-hand and right-hand correspondences of each grapheme-phoneme correspondence (application 11/295,689) is the same as the established link between the last and first pairs of graphic and phonetic elements (instant application), also the states and state transitions derived from the registered transcription rules with a link between the grapheme/phoneme correspondences chaining the two states (application 11/298,689) is the same as the last pair of graphic and phonetic elements being linked with the fist pairs of graphic and phonetic elements (instant application).

As per claims 7, 11, and 12 from application 11/295,689, the obviousness analysis provided above for claims 1, 5, and 6, apply as well. Additionally, it would have been obvious to a person having ordinary skill in the art at the time of the invention that "a phoneticizer" as claimed by application 11/295,689 is a general term for the system or computer program performing the steps provided by the instant application's method of "automatically matching graphic elements constituting given graphic chains to phonetic elements constituting corresponding phonetic chains" as claimed in claims 1 and 7.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luk et al. (Stochastic phonographic transduction for English, 1996) (hereinafter Luk) in view of Griniasty US 20030088416 A1 (hereinafter Griniasty).

As per claims 1 and 7, Luk teaches a method and computer program implemented in a computer for automatically matching graphic elements constituting given graphic chains automatically to phonetic elements constituting corresponding phonetic chains, said method including the following steps:

entering global transcriptions of said graphic chains into said phonetic chains into a database accessible by said computer (Abstract, lines 5-10. Also, in Section 4. Inferring correspondences and rule probabilities, page 140, last paragraph, lines 1-10),

estimating and storing in said database first probabilities of elementary transcriptions of graphic elements into respective phonetic elements (Section 4.1.1. Pass 1, on page 141, more specifically, last paragraph of section 4.1.1 on page 142. Also, in Section 4. Inferring correspondences and rule probabilities, page 140, last paragraph, lines 1-10),

for each transcription of a given graphic chain with M graphic elements into a corresponding phonetic chain with N phonetic elements, determining by MxN iterations second probabilities of MxN second transcriptions of M graphic chains resulting from M successive concatenations of 1 to M graphic elements into N phonetic chains resulting from N successive concatenations of 1 to N phonetic elements, each second probability of a second transcription depending on a preceding estimated first probability of last graphic and phonetic elements of said second transcription and depending on the highest of three respective second probabilities determined by preceding iterations, M and N being integers (Section 4.1.2. Pass 2, on page 142, more specifically equation for *p(i,j)* and Fig. 3), and

establishing and storing a link between last elements of the graphic chain and phonetic chains of each second transcription and last elements of the graphic chain and phonetic chains of the transcription relating to said highest of said three respective second probabilities in order for links established in an MxN matrix relative to said second probabilities to constitute a single path between last and first pairs of graphic and phonetic elements of said matrix in order to segment said given graphic chain into graphemes corresponding to respective phonemes segmenting the corresponding phonetic chain and to store the matches between said graphemes and phonemes in said database, the number of graphic elements in a grapheme being identical to the number of phonetic elements in the corresponding phoneme, in order for any new graphic chain to be transcribed automatically into a phonetic chain segmented into phonemes by means of the stored matches (Section 4.1.2. Pass 2, on page 142, more

specifically lines 1-12 and Fig. 3, and Abstract, lines 19-20. Also, in Section 4. Inferring correspondences and rule probabilities, page 140, last paragraph, lines 1-10).

However, Luk fails to teach determining by MxN iterations second probabilities of MxN second transcriptions of M graphic chains resulting from M successive concatenations of 1 to M graphic elements into N phonetic chains resulting from N successive concatenations of 1 to N phonetic elements

the highest of said three respective second probabilities in order for links established in an MxN matrix relative to said second probabilities to constitute a single path between last and first pairs of graphic and phonetic elements of said matrix in order to segment said given graphic chain into graphemes corresponding to respective phonemes segmenting the corresponding phonetic chain and to store the matches between said graphemes and phonemes in said database

Griniasty teaches that in some speech recognition systems, hidden Markov models (HMMs) of words are obtained by a concatenation of phoneme HMM's. To build word models in such systems, one needs to know the phoneme string that corresponds to the word. In many cases, the phoneme string for a word (i.e., the pronunciation) can be found in a phonetic dictionary. However, many valid words (e.g., family names, business names, etc.) are not typically included within a phonetic dictionary. Therefore, there is a general need for a text-to-phoneme parser that can automatically generate a phoneme string for a written word (Griniasty [0002]).

Griniasty improves this concept by teaching to implement the generalized HMM process 100 of FIG. 6, a "generalized" emission probability matrix and a "generalized"

transition probability matrix may be defined. The generalized emission probability matrix may include, for example, probabilities that specific letter strings will be induced given a phoneme and a previous phoneme (i.e., P(letter string.vertline.phoneme, previous phoneme)). The generalized transition probability matrix may include, for example, probabilities that specific phonemes will occur given a previous phoneme and a previous letter string (i.e., P(phoneme.vertline.previous phoneme, previous letter string)). In at least one embodiment of the present invention, the training method illustrated in FIGS. 3 and 4 is modified to generate the generalized emission probability matrix and generalized transition probability matrix described above. For example, in block 54 of FIG. 4, instead of generating a phoneme emission probability matrix and a phoneme transition probability matrix, the generalized emission probability matrix and generalized transition probability matrix may be generated using the results of the most recent supervised segmentation. Additional cycles of segmentation and matrix regeneration may then be performed to further refine the generalized emission probability matrix and generalized transition probability matrix. Final matrices are eventually generated and stored for later use during text-to-phoneme parsing operations (Griniasty [0029]).

Further, Griniasty teaches With reference to FIG. 5, within square 68, the probability that the phoneme "L" will emit the letter "L" is entered (indicated in the figure as L.vertline.L, where the second L is the phoneme). In square 70, the probability that the phoneme pair "L, OW" will emit the letter "L" (i.e., a diphone) is entered. In square 72, the probability that phoneme "L" will emit the letter string "LO" is entered. In square

74, the sum of: (a) the probability that phoneme "L" will emit the letter "L" and (b) the probability that phoneme "OW" will emit the letter "O" is entered. As is apparent, a path has been created from square 68 to square 74 and the sum represents the score of the path to this square. Two paths lead to square 76 in table 66. In one search approach, scores are calculated for each of these paths and the higher of the two scores is then recorded for the square along with the corresponding path information. The first path that leads to square 76 comes from square 68 and involves the emission of the letter "O" by the phoneme pair "OW, K." The score for this path is the sum of: (a) the probability that phoneme "L" will emit the letter "L" (from square 68) and (b) the probability that the phoneme pair "OW, K" will emit the letter "O." The second path that leads to square 76 comes from square 70 and involves the emission of the letter "O" by the phoneme "K." The score for this path is the sum of: (a) the probability that the phoneme pair "L,OW" will emit the letter "L" (from square 70) and (b) the probability that phoneme "K" will emit the letter "O." After scores have been calculated for the two paths, the higher score is recorded along with the corresponding path information (Griniasty [0016]).

Furthermore, Griniasty teaches the probability that the phoneme "L" will emit the letter string "LOC" is entered as the score. Like square 76, two paths lead square 80. The first path, from square 68, has a score that is the sum of: (a) the probability that phoneme "L" will emit the letter "L" (from square 68) and (b) the probability that phoneme "OW" will emit the letter string "OC." The second path, from square 72, has a score that is the sum of: (a) the probability that phoneme "L" will emit the letter string

"LO" (from square 72) and (b) the probability that phoneme "OW" will emit the letter "C." Again, the higher score is recorded along with the corresponding path information. Three paths lead to square 82. The first path, from square 74, has a score that is the sum of the score of square 74 and the probability that phoneme "K" will emit the letter "C." The second path, from square 70, has a score that is the sum of the score of square 70 and the probability that phoneme "K" will emit the letter string "OC." The third path, from square 72, has a score that is the sum of the score of square 72 and the probability that phoneme pair "OW, K" will emit the letter "C." The highest of the three scores is then recorded along with corresponding path information (Griniasty [0017]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Luk to incorporate determining by MxN iterations second probabilities of MxN second transcriptions of M graphic chains resulting from M successive concatenations of 1 to M graphic elements into N phonetic chains resulting from N successive concatenations of 1 to N phonetic elements and the highest of said three respective second probabilities in order for links established in an MxN matrix relative to said second probabilities to constitute a single path between last and first pairs of graphic and phonetic elements of said matrix in order to segment said given graphic chain into graphemes corresponding to respective phonemes segmenting the corresponding phonetic chain and to store the matches between said graphemes and phonemes in said database as taught by Griniasty to allow for a final ranked set of phonemes based on previous phonemes, wherein the optimum score based on

probability is generated in order to find the best path to concatenate phonemes in the form of a matrix to display all possible probabilities (Griniasty [0016]-[0017]).

As per claim 2, Luk teaches a method according to claim 1, wherein said respective first probability for the determination of a second probability relating to a second transcription of a graphic chain concatenating m graphic elements into a phonetic chain concatenating n phonetic elements, with $1 \leq m \leq M$ and $1 \leq n \leq N$, relates to the last elements in the graphic chain with m graphic elements and the phonetic chain with n phonetic elements (Section 4.1.2. Pass 2, on page 142, more specifically equation for *p(i,j)*, and Abstract, lines 19-20.).

However, Luk fails to teach concatenating n phonetic elements, with $1 \leq m \leq M$ and $1 \leq n \leq N$

Griniasty teaches that in some speech recognition systems, hidden Markov models (HMMs) of words are obtained by a concatenation of phoneme HMM's. To build word models in such systems, one needs to know the phoneme string that corresponds to the word. In many cases, the phoneme string for a word (i.e., the pronunciation) can be found in a phonetic dictionary. However, many valid words (e.g., family names, business names, etc.) are not typically included within a phonetic dictionary. Therefore, there is a general need for a text-to-phoneme parser that can automatically generate a phoneme string for a written word (Griniasty [0002]).

Griniasty improves this concept by teaching to implement the generalized HMM process 100 of FIG. 6, a "generalized" emission probability matrix and a "generalized"

transition probability matrix may be defined. The generalized emission probability matrix may include, for example, probabilities that specific letter strings will be induced given a phoneme and a previous phoneme (i.e., P(letter string.vertline.phoneme, previous phoneme)). The generalized transition probability matrix may include, for example, probabilities that specific phonemes will occur given a previous phoneme and a previous letter string (i.e., P(phoneme.vertline.previous phoneme, previous letter string)). In at least one embodiment of the present invention, the training method illustrated in FIGS. 3 and 4 is modified to generate the generalized emission probability matrix and generalized transition probability matrix described above. For example, in block 54 of FIG. 4, instead of generating a phoneme emission probability matrix and a phoneme transition probability matrix, the generalized emission probability matrix and generalized transition probability matrix may be generated using the results of the most recent supervised segmentation. Additional cycles of segmentation and matrix regeneration may then be performed to further refine the generalized emission probability matrix and generalized transition probability matrix. Final matrices are eventually generated and stored for later use during text-to-phoneme parsing operations (Griniasty [0029]).

Further, Griniasty teaches With reference to FIG. 5, within square 68, the probability that the phoneme "L" will emit the letter "L" is entered (indicated in the figure as L.vertline.L, where the second L is the phoneme). In square 70, the probability that the phoneme pair "L, OW" will emit the letter "L" (i.e., a diphone) is entered. In square 72, the probability that phoneme "L" will emit the letter string "LO" is entered. In square

74, the sum of: (a) the probability that phoneme "L" will emit the letter "L" and (b) the probability that phoneme "OW" will emit the letter "O" is entered. As is apparent, a path has been created from square 68 to square 74 and the sum represents the score of the path to this square. Two paths lead to square 76 in table 66. In one search approach, scores are calculated for each of these paths and the higher of the two scores is then recorded for the square along with the corresponding path information. The first path that leads to square 76 comes from square 68 and involves the emission of the letter "O" by the phoneme pair "OW, K." The score for this path is the sum of: (a) the probability that phoneme "L" will emit the letter "L" (from square 68) and (b) the probability that the phoneme pair "OW, K" will emit the letter "O." The second path that leads to square 76 comes from square 70 and involves the emission of the letter "O" by the phoneme "K." The score for this path is the sum of: (a) the probability that the phoneme pair "L,OW" will emit the letter "L" (from square 70) and (b) the probability that phoneme "K" will emit the letter "O." After scores have been calculated for the two paths, the higher score is recorded along with the corresponding path information (Griniasty [0016]).

Furthermore, Griniasty teaches the probability that the phoneme "L" will emit the letter string "LOC" is entered as the score. Like square 76, two paths lead square 80. The first path, from square 68, has a score that is the sum of: (a) the probability that phoneme "L" will emit the letter "L" (from square 68) and (b) the probability that phoneme "OW" will emit the letter string "OC." The second path, from square 72, has a score that is the sum of: (a) the probability that phoneme "L" will emit the letter string

"LO" (from square 72) and (b) the probability that phoneme "OW" will emit the letter "C." Again, the higher score is recorded along with the corresponding path information. Three paths lead to square 82. The first path, from square 74, has a score that is the sum of the score of square 74 and the probability that phoneme "K" will emit the letter "C." The second path, from square 70, has a score that is the sum of the score of square 70 and the probability that phoneme "K" will emit the letter string "OC." The third path, from square 72, has a score that is the sum of the score of square 72 and the probability that phoneme pair "OW, K" will emit the letter "C." The highest of the three scores is then recorded along with corresponding path information (Griniasty [0017]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Luk to incorporate concatenating n phonetic elements, with $1 \leq m \leq M$ and $1 \leq n \leq N$ as taught by Griniasty to allow for a final ranked set of phonemes based on previous phonemes, wherein the optimum score based on probability is generated in order to find the best path to concatenate phonemes in the form of a matrix to display all possible probabilities (Griniasty [0016]-[0017]).

As per claim 3, Luk teaches a method according to claim 1, wherein said three respective second probabilities determined beforehand for said second transcription of the graphic chain with m graphic elements into the phonetic chain with n phonetic elements respectively relate to a second transcription of a graphic chain with m-1 graphic elements into the phonetic chain with n phonetic elements, a second

transcription of the graphic chain with m graphic elements into a phonetic chain with n-1 phonetic elements and a second transcription of the graphic chain with m-1 graphic elements into the phonetic chain with n-1 phonetic elements (Section 4.1.2. Pass 2, on page 142, more specifically equation for *p(i,j)*).

However, Luk fails to teach graphic chain with m-1 graphic elements into the phonetic chain with n-1 phonetic elements

chain with m graphic elements into the phonetic chain with n phonetic elements respectively relate to a second transcription of a graphic chain with m-1 graphic elements into the phonetic chain with n phonetic elements

Griniasty teaches that in some speech recognition systems, hidden Markov models (HMMs) of words are obtained by a concatenation of phoneme HMM's. To build word models in such systems, one needs to know the phoneme string that corresponds to the word. In many cases, the phoneme string for a word (i.e., the pronunciation) can be found in a phonetic dictionary. However, many valid words (e.g., family names, business names, etc.) are not typically included within a phonetic dictionary. Therefore, there is a general need for a text-to-phoneme parser that can automatically generate a phoneme string for a written word (Griniasty [0002]).

Griniasty improves this concept by teaching to implement the generalized HMM process 100 of FIG. 6, a "generalized" emission probability matrix and a "generalized" transition probability matrix may be defined. The generalized emission probability matrix may include, for example, probabilities that specific letter strings will be induced given a phoneme and a previous phoneme (i.e., P(letter string.vertline.phoneme,

previous phoneme)). The generalized transition probability matrix may include, for example, probabilities that specific phonemes will occur given a previous phoneme and a previous letter string (i.e., P(phoneme.vertline.previous phoneme, previous letter string)). In at least one embodiment of the present invention, the training method illustrated in FIGS. 3 and 4 is modified to generate the generalized emission probability matrix and generalized transition probability matrix described above. For example, in block 54 of FIG. 4, instead of generating a phoneme emission probability matrix and a phoneme transition probability matrix, the generalized emission probability matrix and generalized transition probability matrix may be generated using the results of the most recent supervised segmentation. Additional cycles of segmentation and matrix regeneration may then be performed to further refine the generalized emission probability matrix and generalized transition probability matrix. Final matrices are eventually generated and stored for later use during text-to-phoneme parsing operations (Griniasty [0029]).

Further, Griniasty teaches With reference to FIG. 5, within square 68, the probability that the phoneme "L" will emit the letter "L" is entered (indicated in the figure as L.vertline.L, where the second L is the phoneme). In square 70, the probability that the phoneme pair "L, OW" will emit the letter "L" (i.e., a diphone) is entered. In square 72, the probability that phoneme "L" will emit the letter string "LO" is entered. In square 74, the sum of: (a) the probability that phoneme "L" will emit the letter "L" and (b) the probability that phoneme "OW" will emit the letter "O" is entered. As is apparent, a path has been created from square 68 to square 74 and the sum represents the score of the

path to this square. Two paths lead to square 76 in table 66. In one search approach, scores are calculated for each of these paths and the higher of the two scores is then recorded for the square along with the corresponding path information. The first path that leads to square 76 comes from square 68 and involves the emission of the letter "O" by the phoneme pair "OW, K." The score for this path is the sum of: (a) the probability that phoneme "L" will emit the letter "L" (from square 68) and (b) the probability that the phoneme pair "OW, K" will emit the letter "O." The second path that leads to square 76 comes from square 70 and involves the emission of the letter "O" by the phoneme "K." The score for this path is the sum of: (a) the probability that the phoneme pair "L,OW" will emit the letter "L" (from square 70) and (b) the probability that phoneme "K" will emit the letter "O." After scores have been calculated for the two paths, the higher score is recorded along with the corresponding path information (Griniasty [0016]).

Furthermore, Griniasty teaches the probability that the phoneme "L" will emit the letter string "LOC" is entered as the score. Like square 76, two paths lead square 80. The first path, from square 68, has a score that is the sum of: (a) the probability that phoneme "L" will emit the letter "L" (from square 68) and (b) the probability that phoneme "OW" will emit the letter string "OC." The second path, from square 72, has a score that is the sum of: (a) the probability that phoneme "L" will emit the letter string "LO" (from square 72) and (b) the probability that phoneme "OW" will emit the letter "C." Again, the higher score is recorded along with the corresponding path information. Three paths lead to square 82. The first path, from square 74, has a score that is the

sum of the score of square 74 and the probability that phoneme "K" will emit the letter "C." The second path, from square 70, has a score that is the sum of the score of square 70 and the probability that phoneme "K" will emit the letter string "OC." The third path, from square 72, has a score that is the sum of the score of square 72 and the probability that phoneme pair "OW, K" will emit the letter "C." The highest of the three scores is then recorded along with corresponding path information (Griniasty [0017]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Luk to incorporate graphic chain with m-1 graphic elements into the phonetic chain with n-1 phonetic elements and chain with m graphic elements into the phonetic chain with n phonetic elements respectively relate to a second transcription of a graphic chain with m-1 graphic elements into the phonetic chain with n phonetic elements as taught by Griniasty to allow for a final ranked set of phonemes based on previous phonemes, wherein the optimum score based on probability is generated in order to find the best path to concatenate phonemes in the form of a matrix to display all possible probabilities (Griniasty [0016]-[0017]).

As per claim 4, Luk teaches a method according to claim 1, comprising estimating other first probabilities of transcriptions of each of said graphic elements respectively into said phonetic elements as a function of the ranks of said phonetic elements placed in said given phonetic chains that were segmented into phonemes, in order again to determine second probabilities of MxN second transcriptions of each transcription of a given graphic chain with M graphic elements into a corresponding

phonetic chain with N phonetic elements and to establish a corrected path linking the last pair to the first pair in a new MxN matrix of second probabilities (Section 4.1.3. Pass 3, and Section 4.2. Re-estimation of transition probabilities, more specifically, lines 1-6).

However, Luk fails to teach second probabilities of MxN second transcriptions of each transcription of a given graphic chain with M graphic elements into a corresponding phonetic chain with N phonetic elements and to establish a corrected path linking the last pair to the first pair in a new MxN matrix of second probabilities.

Griniasty teaches that in some speech recognition systems, hidden Markov models (HMMs) of words are obtained by a concatenation of phoneme HMM's. To build word models in such systems, one needs to know the phoneme string that corresponds to the word. In many cases, the phoneme string for a word (i.e., the pronunciation) can be found in a phonetic dictionary. However, many valid words (e.g., family names, business names, etc.) are not typically included within a phonetic dictionary. Therefore, there is a general need for a text-to-phoneme parser that can automatically generate a phoneme string for a written word (Griniasty [0002]).

Griniasty improves this concept by teaching to implement the generalized HMM process 100 of FIG. 6, a "generalized" emission probability matrix and a "generalized" transition probability matrix may be defined. The generalized emission probability matrix may include, for example, probabilities that specific letter strings will be induced given a phoneme and a previous phoneme (i.e., P(letter string.vertline.phoneme, previous phoneme)). The generalized transition probability matrix may include, for example, probabilities that specific phonemes will occur given a previous phoneme and

a previous letter string (i.e., P(phoneme.vertline.previous phoneme, previous letter string)). In at least one embodiment of the present invention, the training method illustrated in FIGS. 3 and 4 is modified to generate the generalized emission probability matrix and generalized transition probability matrix described above. For example, in block 54 of FIG. 4, instead of generating a phoneme emission probability matrix and a phoneme transition probability matrix, the generalized emission probability matrix and generalized transition probability matrix may be generated using the results of the most recent supervised segmentation. Additional cycles of segmentation and matrix regeneration may then be performed to further refine the generalized emission probability matrix and generalized transition probability matrix. Final matrices are eventually generated and stored for later use during text-to-phoneme parsing operations (Griniasty [0029]).

Further, Griniasty teaches With reference to FIG. 5, within square 68, the probability that the phoneme "L" will emit the letter "L" is entered (indicated in the figure as L.vertline.L, where the second L is the phoneme). In square 70, the probability that the phoneme pair "L, OW" will emit the letter "L" (i.e., a diphone) is entered. In square 72, the probability that phoneme "L" will emit the letter string "LO" is entered. In square 74, the sum of: (a) the probability that phoneme "L" will emit the letter "L" and (b) the probability that phoneme "OW" will emit the letter "O" is entered. As is apparent, a path has been created from square 68 to square 74 and the sum represents the score of the path to this square. Two paths lead to square 76 in table 66. In one search approach, scores are calculated for each of these paths and the higher of the two scores is then

recorded for the square along with the corresponding path information. The first path that leads to square 76 comes from square 68 and involves the emission of the letter "O" by the phoneme pair "OW, K." The score for this path is the sum of: (a) the probability that phoneme "L" will emit the letter "L" (from square 68) and (b) the probability that the phoneme pair "OW, K" will emit the letter "O." The second path that leads to square 76 comes from square 70 and involves the emission of the letter "O" by the phoneme "K." The score for this path is the sum of: (a) the probability that the phoneme pair "L,OW" will emit the letter "L" (from square 70) and (b) the probability that phoneme "K" will emit the letter "O." After scores have been calculated for the two paths, the higher score is recorded along with the corresponding path information (Griniasty [0016]).

Furthermore, Griniasty teaches the probability that the phoneme "L" will emit the letter string "LOC" is entered as the score. Like square 76, two paths lead square 80. The first path, from square 68, has a score that is the sum of: (a) the probability that phoneme "L" will emit the letter "L" (from square 68) and (b) the probability that phoneme "OW" will emit the letter string "OC." The second path, from square 72, has a score that is the sum of: (a) the probability that phoneme "L" will emit the letter string "LO" (from square 72) and (b) the probability that phoneme "OW" will emit the letter "C." Again, the higher score is recorded along with the corresponding path information. Three paths lead to square 82. The first path, from square 74, has a score that is the sum of the score of square 74 and the probability that phoneme "K" will emit the letter "C." The second path, from square 70, has a score that is the sum of the score of

square 70 and the probability that phoneme "K" will emit the letter string "OC." The third path, from square 72, has a score that is the sum of the score of square 72 and the probability that phoneme pair "OW, K" will emit the letter "C." The highest of the three scores is then recorded along with corresponding path information (Griniasty [0017]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Luk to incorporate second probabilities of MxN second transcriptions of each transcription of a given graphic chain with M graphic elements into a corresponding phonetic chain with N phonetic elements and to establish a corrected path linking the last pair to the first pair in a new MxN matrix of second probabilities as taught by Griniasty to allow for a final ranked set of phonemes based on previous phonemes, wherein the optimum score based on probability is generated in order to find the best path to concatenate phonemes in the form of a matrix to display all possible probabilities (Griniasty [0016]-[0017]).

As per claim 6, Luk teaches a method according to claim 1, wherein said phonetic chains are phonetically readable by any person who is not an expert in phonetics, and said new graphic chain is automatically transcribed into a phonetic chain segmented into phonemes that can be read by any person who is not an expert in phonetics by means of stored matches to be included in a short message (Section 2. Principles of stochastic phonographic transduction, second paragraph, lines 9-10).

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Luk (Stochastic phonographic transduction for English, 1998) in view of Griniasty US 20030088416 A1 (hereinafter Griniasty) and further in view of Junqua et al. (US Patent 6,684,185) (hereinafter Junqua).

As per claim 5, Luk teaches a method according to claim 1, wherein said new graphic chain is being entered and said phonetic chain segmented into phonemes by means of said stored matches is used for orthographic correction of said new graphic chain entered (Section 4. Inferring correspondences and rule probabilities, page 140, last paragraph, lines 1-10, and Section 6.2. Training and test data, first paragraph, lines 4-6, also Abstract starting in page 133, third paragraph lines 1-3 and 7-9. It is noted that Luk does not specifically mention the intended use of the system for orthographic correction of said new graphic chain entered, however, it would have been obvious to a person having ordinary skill in the art at the time of the invention that since Luk's method provides all of the limitations as set forth in claims 1 and 5 for performing transcriptions of graphic chains to phonetic chains, the method is also capable or useful for providing the function of orthographic correction.).

However, Luk in view of Griniasty does not specifically mention the new graphic chain being entered on a terminal keyboard.

Conversely, Junqua teaches the new graphic chain being entered on a terminal keyboard (Col. 1, line 62 to Col. 2, line 2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the feature of the new graphic chain being entered on

a terminal keyboard as taught by Junqua for Luk's method because Junqua provides a small memory footprint recognizer that may be trained quickly and without large memory consumption by entry of new words through spelling, wherein the entry could be through a keyboard or a touch-tone pad of a telephone (Col. 1, lines 62-67). The spelled word entered by the user is processed by a phoneticizer which converts the spelled word letters into one or more phonetic transcriptions (Col. 4, lines 38-40).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael C Colucci/
Examiner, Art Unit 2626
Patent Examiner
AU 2626
(571)-270-1847
Michael.Colucci@uspto.gov

/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626